

MONITORED NATURAL ATTENUATION

WSC #02 - 500

PUBLIC COMMENT DRAFT

**BWSC Program Advisory Committee
January 24, 2002**

This policy provides guidance for purposes of 310 CMR 40.0191 and 40.0800 on acceptable approaches for the selection, design, and implementation of Monitored Natural Attenuation (MNA) as a Comprehensive Response Action at disposal sites regulated under the Massachusetts Contingency Plan (the “MCP” or 310 CMR 40.0000).

This document is intended solely as guidance. It does not create any substantive or procedural rights, and is not enforceable by any party in any administrative proceeding with the Commonwealth. This document provides guidance on approaches DEP considers acceptable for meeting the general requirements set forth in the MCP. Parties using this guidance should be aware that other acceptable alternatives may be available for achieving compliance with general regulatory requirements.

BACKGROUND

Over the last few years, Monitored Natural Attenuation (MNA) has drawn increasing nationwide attention from both technical and regulatory perspectives, and most of the leading experts in the country have published works on this topic. Since 1998, DEP has participated in, sponsored, and/or promoted at least four live seminars on MNA. These training classes have included up to 70 DEP staff and up to 150 Licensed Site Professionals (LSPs), who received continuing education credit. Through our training and our networking with other states, EPA, private industry, and LSPs, the Bureau of Waste Site Cleanup (BWSC) has followed the latest regulatory and technical developments. Also during this time, MNA has prompted extensive discussion within DEP, which has helped to shape our collective opinions. During these discussions, the following common themes consistently have emerged:

- 1) Most DEP staff (and many other environmental professionals around the country) familiar with MNA agree that the most comprehensive and important **policy** document already published is “Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites”; U.S. EPA OSWER Directive 9200.4-17P; April 21, 1999 FINAL (“the OSWER Directive”). Since 1998 (when the directive was a draft) a number of internal and external parties have provided favorable opinions of this document, and BWSC regularly has recommended it to staff, LSPs, and any other interested party.
- 2) Several excellent **technical** guidance publications are referenced in the OSWER Directive. Given the highly technical nature and continually evolving scientific understanding of MNA, and given that these documents already exist, producing our own **technical** guidance document is impractical and unnecessary. Four technical guidance documents DEP commonly has recommended are:
 - “Technical Protocol for evaluating Natural Attenuation of Chlorinated Solvents in Ground Water”; EPA/600/R-98/128; September, 1998.
 - “Standard Guide for Remediation of Ground Water by Natural Attenuation at Petroleum Release Sites”; ASTM E 1943-98; August, 1998.
 - “Natural Attenuation of Chlorinated Solvents in Groundwater: Principles and Practices”; Interstate Technology and Regulatory Cooperation; September, 1999.
 - “Natural Attenuation for Groundwater Remediation”; National Academy of Sciences; ISBN 0-309-06932-7; 2000.
- 3) Collectively, the OSWER Directive, these other documents, and the publications referenced in them contain the fundamental regulatory and technical elements of MNA that DEP considers to be applicable to our program. As these elements relate specifically to the Massachusetts Contingency Plan (the “MCP” or 310 CMR 40.0000), a number of issues have emerged over the last three years that need emphasis and/or clarification. This policy addresses these issues.

REGULATORY AUTHORITY

DEP's recognition and expected use of the OSWER Directive, as well as all other relevant guidance, are consistent with the following regulation under the MCP:

310 CMR 40.0191 Response Action Performance Standard (RAPS)

- (2) RAPS shall be employed during the performance of all response actions conducted pursuant to 310 CMR 40.0000, and shall include, without limitation, the following:
 - (a) consideration of relevant policies and guidelines issued by the Department and EPA;
 - (b) use of accurate and up-to-date methods, standards and practices, equipment and technologies which are appropriate, available and generally accepted by the professional and trade communities conducting response actions in accordance with M.G.L. c. 21E and 310 CMR 40.0000 under similar circumstances

APPLICABILITY

The OSWER Directive, along with the other referenced documents, contains a significant number of important regulatory and technical aspects that are applicable and which should be considered during the selection, design, and/or implementation of an MNA program. Those most often needing emphasis and/or clarification include:

- a) Clearly (as even a cursory overview of the published works indicates), MNA is not a "do nothing" option. A common misconception is that MNA is an inexpensive remedial strategy; often it is not. Like any remedy chosen in Phase III as a likely and feasible permanent solution, MNA is a Comprehensive Response Action following the requirements under 310 CMR 40.0800. As detailed in the OSWER Directive, fundamental components of any MNA remedy include source control, prevention of plume migration, extensive long-term performance monitoring, and contingency remedies. The OSWER Directive also states that proper evaluation of MNA usually requires a more detailed level of site characterization than is needed for other remedies, and that reliance on MNA as the sole remedy will be appropriate only at relatively few contaminated sites. Therefore, the design and planning of an MNA program require adequate development of the conceptual site model and are commensurate, appropriately, with a Phase IV level of effort. Should the MNA program extend beyond five years, Phase V/Remedy Operation Status would apply.
- b) While various attenuation processes are known to occur under certain conditions (such as, biodegradation; dispersion; dilution; sorption; volatilization; radioactive decay; and chemical or biological stabilization, transformation or destruction), the OSWER Directive "prefers those processes that degrade or destroy contaminants." Moreover, 310 CMR 40.0191, the Response Action Performance Standard, requires the consideration of "technologies which reuse, recycle, destroy, detoxify or treat oil and/or hazardous materials" as well as "remedial actions to reduce the overall mass and volume of oil and/or hazardous materials." Therefore, the use of MNA requires site-specific

**Public Comment Draft
BWSC PAC 1/24/02**

documentation that degradation or destruction of contaminants is the primary attenuation process. Typically, these processes are evaluated through what is commonly referred to throughout the literature as the “second line of evidence.” Even if degradation or destruction is shown to be the primary process, the evaluation also should assess any adverse effects of any cross-media transfer of contaminants and of any transformation products that are more toxic and/or mobile than the parent contaminant. This evaluation is consistent with that required for the selection of any remedy under 310 CMR 40.0000.

c) **The evaluation and use of MNA as a remedial technology are independent and distinct from the requirement to evaluate the feasibility of achieving or approaching background.** First and foremost, MNA is evaluated, designed, and implemented like any other Comprehensive Response Action to remediate contamination at levels **above** No Significant Risk. Also like any other Comprehensive Response Action, MNA may or may not be a feasible means of achieving or approaching background.

d) As is the case with any remedial technology, MNA cannot be a temporary solution if it is chosen to be the final remedy (in other words, if site-specific cleanup goals are anticipated to be reached by using MNA). Only if MNA and all other possible remedies cannot be anticipated to reach site-specific cleanup goals can MNA be considered as a temporary solution.

Again, the OSWER Directive, together with the other referenced documents, contains a number of additional important regulatory and technical aspects of MNA that also should be considered. The OSWER Directive is attached as DEP’s primary reference for MNA.

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